Claims

1. Method for detecting an information signal, tone and/or a phase change of a tone in one or more signals which contain *inter alia* this information signal or this tone, characterised in that each signal is divided into time segments (blocks), in that only a selection of the blocks are further processed for detection, whereas the blocks not selected are not further processed, the signal in the blocks being made available for further processing in the form of sample values of a signal in the time domain, in that the blocks are subjected to transformation, for example transformation from the time domain to the frequency domain, to produce at least one output value, and in that a decision in relation to the detection is made with the aid of the at least one output value of the transformation.

2. Method in particular according to claim 1, characterised in that the output values of the transformation of a plurality of selected blocks are mapped by a function or mapping in at least one result, and in that the result is used to produce a decision value.

3. Method according to claim 2, characterised in that the mapping provides a summation which is complex if desired.

4. Method according to claim 2, characterised in that the mapping represents a product formation which is complex if desired.

5. Method according to one of the preceding claims, characterised in that the transformation is frequency-selective and has been or is adjusted to the frequency of the tone currently to be detected.

6. Method according to one of the preceding claims, characterised in that a Fourier transform is used.

7. Method according to one of the preceding claims, characterised in that a Fourier transform is used after multiplication of the time signal by a window.

8. Method according to claim 6 or 7, characterised in that the Fourier transform is computed by using a Goertzel algorithm, this having been or being adjusted to the frequency of the tone to be detected in each case.

9. Method according to one of the preceding claims, characterised in that the phase relation is detected at a first moment and a moment which is delayed by a defined time difference (corresponding to a first and a subsequent block) to determine a phase change from complex output values of the transformation, in that the phase difference of the phase relations at the two moments is compared with the phase difference of the phase relations of a third moment which is delayed by the same time difference in comparison with the second moment with respect to the second moment, and in that in the event of sufficiently exact coincidence of the two phase differences the absence of a phase change in the signal is decided on and in the event of a large deviation in the two phase differences the presence of a phase change in the signal is decided on.

10. Method according to claim 9, characterised in that the complex number describing the phase is determined with only twelve real multiplications.

11. Method according to claim 9 or 10, characterised by its implementation by evaluation of the formula

$$\tilde{y}_{v}(N-1)\,\tilde{y}^{*}_{v+2}(N-1)\,\tilde{y}^{*}_{v+2}(N-1)\,\tilde{y}_{v+4}(N-1) = z$$

12. Method according to one of the preceding claims, characterised in that the block length (= number of sample values of a block) and/or the number of blocks used for detection is adjusted as a function of the signal/noise ratio (SNR) of the signal in such a way that a substantially constant error rate of detection is achieved over a range of signal/noise ratios.

13. Method according to one of the preceding claims, characterised in that a plurality of channels are processed in a type of time-division multiplex with offset blocks.

14. Device for detecting an information signal, tone and/or a phase change of a tone in one or more signals which contain(s) *inter alia* this information signal or this tone, characterised in that the device has means for carrying out the method according to one of the preceding claims.

15. Device according to claim 14, characterised by a central processor (34), a memory device (32) and a control device (30) which during operation supplies data contained in the memory device (32) concerning tones to be detected (frequencies) to the central processor (34) which emits an output signal characteristic of the presence of a frequency to be detected and/or a phase change.